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एरियल रोपवे हेतु  
इस्पात के रोपवे की विशिष्टि  
भाग 2 ट्रैक रोप  
( पहला पुनरीक्षण )

**Specification for Steel Wire Ropes  
for Aerial Ropeways**  
Part 2 Track Ropes  
( First Revision )

ICS 77.140.65

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## FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Wire Ropes and Wire Products Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was originally published in 1986. The major changes in this revision are:

- a) Table 1 that includes rope size, construction, tensile designation and construction of a new rope that is  $1 \times 7$  (6-1), has been included;
- b) Table 3 that includes breaking load and mass of  $1 \times 7$  (6-1) has been added; and
- c) In Table 1, construction, size range (mm) and tensile designation ( $N/mm^2$ ) for all the wires have been changed; as a result the corresponding values of Table 2, Table 4 and Table 5 have also been changed.

This standard is published in two parts. The other part in this series is:

### Part 1 Haulage ropes

The composition of the committee, responsible for formulation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***SPECIFICATION FOR STEEL WIRE ROPES  
FOR AERIAL ROPEWAYS****PART 2 TRACK ROPES***( First Revision )***1 SCOPE**

This standard specifies the general requirements for steel wire track ropes, used for aerial ropeways.

**2 REFERENCES**

The standards given below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below:

<i>IS No.</i>	<i>Title</i>
IS 2363 : 1981	Glossary of terms relating to wire ropes
IS 6594 : 2018	Technical supply conditions for steel wire ropes and strands

**3 CONSTRUCTION**

The rope sizes, construction and tensile designation shall be as given in Table 1.

**3.1 Wire Tensile Strength Grade**

To meet the required rope breaking strength, the manufacturer may use any combination of the tensile strength of round and shaped wires, given in Table 1, provided that all the round wires in any one layer of the rope are of one tensile grade. Similarly, all the shaped wires in any one layer of the rope are of one tensile grade.

**Table 1 Rope Size, Construction and Tensile Designation**

Sl. No.	Construction	Size Range Mm	Tensile Designation N/mm <sup>2</sup>
(1)	(2)	(3)	(4)
i)	Half Lock	20 - 64	1230, 1370, 1470, 1570, 1770
	Full Lock	20 - 80	
ii)	1 × 7 (6-1)	6 - 15	1570, 1770
	1 × 19 (12:6-1)	13 - 26	
	1 × 37 (18:12:6-1)	18 - 32	

**4 TERMINOLOGY**

See IS 2363

**5 ROPE SIZE AND TOLERANCE**

**5.1** The size of the rope, designated as 'Nominal Diameter' shall be as given in Table 2, 3, 4 and 5.

**5.2** The tolerance on diameter, when measured at no load condition, shall be  $\pm 2$  percent of the specified nominal diameter of Locked Col Ropes.

**5.3** The tolerance on diameter, when measured at no load condition, shall be  $-1$  percent,  $+4$  percent for spiral strand ropes.

**6 MINIMUM BREAKING LOAD**

Minimum breaking load shall be as given in Table 2, 3 and 4.

**7 GENERAL REQUIREMENTS**

The strands and wire ropes shall conform to IS 6594 and shall also meet the following requirements:

**7.1 Joints**

Joint in wire shall be made by welding or brazing.

**7.2 Lay**

The wire ropes shall be in right hand lay unless otherwise specified.

**8 GALVANIZING**

Unless otherwise agreed to between the supplier and the purchaser the wire ropes shall be supplied in ungalvanized conditions.

**9 TESTS**

The track ropes shall meet the test requirements laid down IS 6594.

**10 MARKING**

**10.1** The track ropes shall have the following information marked on the metal tag in a permanent and legible manner in a location where it is accessible and visible:

- a) Name of manufacturer;

- b) Product class;
- c) Mesh size, in mm;
- d) Mesh wire diameter, in mm;
- e) Length, width and height of gabion/gabion mattress, in m;
- f) Class of coating;
- g) Batch number or date of manufacturing; and
- h) Any other information as specified by the purchaser.

### 10.2 BIS Certification Marking

The track ropes may also be marked with the Standard Mark.

**10.2.1** The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations made thereunder. The details of the conditions under which the licence for use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

### 10.3 Information to be supplied at the Time of Enquiry or Order:

The following information shall be supplied at the time of enquiry or order by the purchaser or indenter:

- a) Gabions or gabion mattresses;
- b) Size in m (length  $\times$  width  $\times$  height);
- c) Class (*see 4*);
- d) Mesh size in mm and mesh wire diameter, in mm;
- e) IS designation and year of issue;
- f) Quantity (number of units);
- g) Manufacturer's certificate, if required (*see 14*); and
- h) Any other requirement.

NOTE — A typical ordering description is as follows: 100 gabions, Size: 1.80 m  $\times$  0.90 m  $\times$  0.90 m, Mesh Size: 100 mm  $\times$  100 mm  $\times$  4.0 mm as shown on plans; Class A or Class B; with required spiral binders, lacing wire and stiffeners.

## 11 CERTIFICATES

When specified in the purchase order or contract, a manufacturer's certificate shall be furnished to the purchaser that the material has been manufactured, tested, and inspected in accordance with requirements of this standard and has been found to be conforming to the requirements. When specified in the contract or purchase order, reports of the test results for each batch supplied shall be furnished.

## 12 INSTALLATION MANUAL

The manufacturer shall supply an installation manual for installation of the product.

**Table 2 Breaking Load and Mass for Locked Coil Wire Ropes**  
(Clause 5.1 and 6)

Nominal Diameter	Approximate Mass	Minimum Breaking Load Corresponding to Tensile Designation of Locked Coil Wire Rope		
		1230	1370	1470
(1) mm	(2) kg/100 m	(3) kN	(4) kN	(5) kN
20	224	288	310	333
22	271	349	375	403
24	323	415	446	480
25	350	451	484	521
26	392	488	524	563
28	455	567	609	652
30	522	651	699	749
32	594	740	795	852
34	670	836	898	962
36	752	940	1010	1080
38	838	1042	1120	1210
40	928	1154	1240	1330
42	1023	1275	1370	1470
44	1123	1396	1500	1610
46	1227	1536	1650	1760
48	1336	1657	1780	1920
50	1450	1750	1880	2080
52	1568	1899	2040	2240
54	1691	2057	2210	2420
56	1819	2196	2360	2610
58	1951	2364	2540	2790
60	2088	2531	2720	2990
62	2268	2699	2900	3200
64	2417	2876	3090	3310
66	2570	3053	3280	3520
68	2728	3248	3490	3730
70	2891	3443	3700	3960
72	3059	3639	3910	4200
74	3231	3853	4140	4430
76	3408	4058	4360	4670
78	3590	4272	4590	4920
80	3776	4495	4830	5180

**Table 3 Breaking Load and Mass of 1 × 7 (6-1) Construction***(Clause 5.1 and 6)*

Nominal Diameter	Approximate Mass	Minimum Breaking Load Corresponding to Tensile Designation of Spiral Strand Rope	
		1570	1770
(1)	(2)	(3)	(4)
Mm	kg/100 m	kN	kN
6	18.1	30.5	34.4
7	24.6	42.0	47.4
8	32.1	54.5	61.4
9	40.7	69.0	77.8
10	50.2	85.5	96.4
11	60.7	103	116
12	72.3	123	139
13	84.8	144	162
14	98.4	167	188
15	113	192	216

**Table 5 Breaking Load And Mass of 1 × 37 (18:12:6-1) Construction***(Clause 5.1 and 6)*

Nominal Diameter	Approximate Mass	Minimum Breaking Load Corresponding to Tensile Designation of Spiral Strand Rope	
		1570	1770
(1)	(2)	(3)	(4)
mm	kg/100 m	kN	kN
18	159	260	293
20	196	321	362
22	237	390	440
24	282	464	523
26	331	543	612
28	383	631	711
32	501	824	929

**Table 4 Breaking Load and Mass of 1 × 19 (12:6-1) Construction***(Clause 5.1 and 6)*

Nominal Diameter	Approximate Mass	Minimum Breaking Load Corresponding to Tensile Designation of Spiral Strand Rope	
		1570	1770
(1)	(2)	(3)	(4)
mm	kg/100 m	kN	kN
13	84.0	140	158
14	97.0	162	183
16	127	211	238
18	161	267	301
20	198	330	372
22	240	399	450
24	285	475	536
26	334	557	628

**ANNEX A**

*( Foreword )*

**COMMITTEE COMPOSITION**

Wire Ropes and Wire Products Sectional Committee, MED 10

<i>Organization</i>	<i>Representative(s)</i>
Directorate General of Mines Safety, Dhanbad	SHRI D. B. NAIK ( <b>Chairman</b> ) SHRI VIJAY KUMAR KAVALI ( <i>Alternate</i> )
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Bharat Wire Ropes Limited, Mumbai	SHRI SUMIT NADAK SHRI SANJEEV RAI ( <i>Alternate</i> )
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Directorate General of Aeronautical Quality Assurance, New Delhi	SHRI S. CHAWLA SHRI RISHI KUMAR ( <i>Alternate</i> )
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Tata Steel Limited, Dhanbad	SHRI A. N. BHAGAT SHRI TANMAY BHATTACHARYA ( <i>Alternate</i> )
The Shipping Corporation of India Limited, Mumbai	SHRI G. S. BHALLA CAPT. R. MODI ( <i>Alternate</i> )
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Usha Martin Industries Limited, Ranchi	SHRI SUBRATA DUTTA SHRI SANDEEP JAISWAL ( <i>Alternate</i> )

*Member Secretary*

SHRI SANDEEP KESHAV  
Scientist B (MED), BIS



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